Application Solution

Maintain the Battery of a ControlLogix Series B Controller

Catalog Numbers 1756-BA2 and 1756-L61, 1756-L62, 1756-L63, 1756-L64 Series B

When to Use This Document

Use this document to make sure your 1756-BA2 battery:

- has enough capacity to hold the memory of the controller.
- doesn't leak or cause other hazards.

Use this table to see if this document is for your controller.

If you have this controller	And this series	Then
ControlLogix5550 ControlLogix5555 ControlLogix5560M03SE	⇒	**STOP!** Your controller uses a 1756-BA1 battery. See ControlLogix System User Manual, publication 1756-UM001, for that battery.
ControlLogix5561 ControlLogix5562 ControlLogix5563	A	**STOP!** Your controller uses a 1756-BA1 battery. See ControlLogix System User Manual, publication 1756-UM001, for that battery.
ControlLogix5561 ControlLogix5562 ControlLogix5563 ControlLogix5564	B	YES, your controller uses a 1756-BA2 battery. Use this publication for that battery.

How to Use This Document

This document gives you this information.

If you want to	Then see this section	On this page
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Publication 1756-AP014B-EN-E - January 2007

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://literature.rockwellautomation.com) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

WARNING	Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
ATTENTION	Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you to identify a hazard, avoid a hazard, and recognize the consequences.
SHOCK HAZARD	Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
BURN HAZARD	Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

IAbout the 1756-BA2 Battery

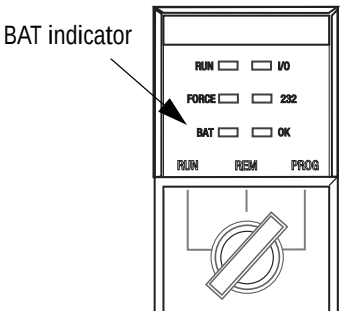
This section gives you some general information about the 1756-BA2 battery.

How does the controller use the battery?	Series B of the ControlLogix5561, ControlLogix5562, ControlLogix5563, and ControlLogix5564 controllers use the battery to: • store a copy of your project when you power down the controller. The controller stores the copy in its internal nonvolatile memory. This memory is built into the controller and is separate from the CompactFlash card. • keep its internal clock running when the controller is without power.
What effects battery life?	In series B of the ControlLogix5561, ControlLogix5562, ControlLogix5563, and ControlLogix5564 controllers, battery life depends primarily on: • chassis temperature. • project size. • how often you cycle power. In addition, there is always a small constant drain on the battery. The drain is the same whether or not the controller has power.

Checking the Battery Charge

When the battery is about 95% discharged, the controller gives the following low-battery warnings:

- The BAT indicator turns solid red.
- A minor fault occurs (type 10, code 10).



ATTENTION

To prevent your battery from leaking potentially dangerous chemicals, replace your battery according to the following schedule. Replace the battery even if the BAT indicator is off.

If the temperature 25.4 mm (1 in.) below the chassis is	Replace the battery within
0…35 °C (0…95 °F)	3 years
36…40 °C (97…104 °F)	3 years
41…45 °C (106…113 °F)	2 years
46…50 °C (115…122 °F)	16 months
51…55 °C (124…131 °F)	11 months
56…60 °C (133…140 °F)	8 months

Estimating Battery Life

Use the following table to estimate how long before the battery becomes low (BAT indicator = solid red).

Max Temperature 25.4 mm (1 in.) Below the Chassis	Power Cycles	Battery Life Before the BAT Indicator Turns Red (Worst-case Estimate)				
		Project Size				
		1 MB	2 MB	4 MB	8 MB	16 MB
0…40 °C (0…104 °F)	3 per day	3 years	3 years	26 months	20 months	10 months
	2 per day or less	3 years	3 years	3 years	31 months	16 months
41…45 °C (106…113 °F)	3 per day	2 years	2 years	2 years	20 months	10 months
	2 per day or less	2 years	2 years	2 years	2 years	16 months
46…50 °C (115…122 °F)	3 per day or less	16 months	16 months	16 months	16 months	10 months
51…55 °C (124…131 °F)	3 per day or less	11 months	11 months	11 months	11 months	10 months
56…60 °C (133…140 °F)	3 per day or less	8 months	8 months	8 months	8 months	8 months

EXAMPLE

Under the following conditions the battery will last at least 20 months before the BAT indicator turns red.

- The maximum temperature 25.4 mm (1 in.) below the chassis = 45 °C (113 °F).
- You cycle power to the controller three times per day.
- The controller contains an 8 MB project.

Estimating Warning Time

Use this table to estimate the battery life after the low-battery warning (BAT indicator = solid red). Use these times whether or not the controller has power. There is always a small constant drain on the battery.

IMPORTANT When you apply power to the controller, see if there is a low-battery warning. If you get a low-battery warning for the first time, you have less battery life than this table shows. While powered down, the controller still drains the battery but it can't give the low-battery warning.

Max Temperature 25.4 mm (1 in.) Below the Chassis	Power Cycles	Battery Life After the BAT Indicator Turns Red (Worst-case Example)				
		Project Size				
		1 MB	2 MB	4 MB	8 MB	16 MB
0…20 °C (0…68 °F)	3 per day	26 weeks	18 weeks	12 weeks	9 weeks	5 weeks
	1 per Day	26 weeks	26 weeks	26 weeks	22 weeks	13 weeks
	1 per Month	26 weeks	26 weeks	26 weeks	26 weeks	26 weeks
21…40 °C (70…104 °F)	3 per day	18 weeks	14 weeks	10 weeks	8 weeks	5 weeks
	1 per Day	24 weeks	21 weeks	18 weeks	16 weeks	11 weeks
	1 per Month	26 weeks	26 weeks	26 weeks	26 weeks	26 weeks
41…45 °C (106…113 °F)	3 per day	12 weeks	10 weeks	7 weeks	6 weeks	4 weeks
	1 per Day	15 weeks	14 weeks	12 weeks	11 weeks	8 weeks
	1 per Month	17 weeks	17 weeks	17 weeks	17 weeks	16 weeks
46…50 °C (115…122 °F)	3 per day	10 weeks	8 weeks	6 weeks	6 weeks	3 weeks
	1 per Day	12 weeks	11 weeks	10 weeks	9 weeks	7 weeks
	1 per Month	12 weeks	12 weeks	12 weeks	12 weeks	12 weeks
51…55 °C (124…131 °F)	3 per day	7 weeks	6 weeks	5 weeks	4 weeks	3 weeks
	1 per Day	8 weeks	8 weeks	7 weeks	7 weeks	5 weeks
	1 per Month	8 weeks	8 weeks	8 weeks	8 weeks	8 weeks
56…60 °C (133…140 °F)	3 per day	5 weeks	5 weeks	4 weeks	4 weeks	2 weeks
	1 per Day	6 weeks	6 weeks	5 weeks	5 weeks	4 weeks
	1 per Month	6 weeks	6 weeks	6 weeks	6 weeks	6 weeks

EXAMPLE Under the following conditions the battery is good for another sic weeks after the BAT indicator turns red:

- The maximum temperature 25.4 mm (1 in.) below the chassis = 45 °C (113 °F)
- You cycle power to the controller three times per day
- The controller contains an 8 MB project

Replace a Battery

Follow these steps to replace a battery.

WARNING

When you connect or disconnect the battery, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.

For safety information on the handling of lithium batteries, including handling and disposal of leaking batteries, see Guidelines for Handling Lithium Batteries, publication AG-5.4.

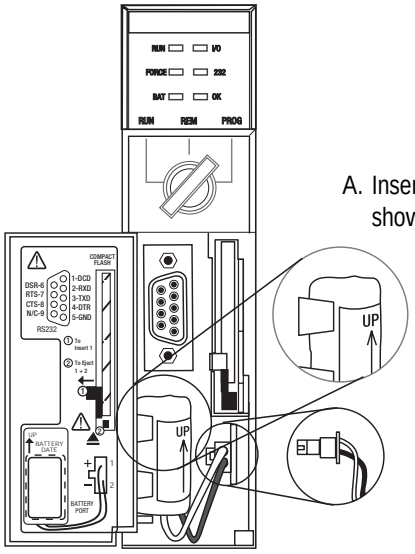
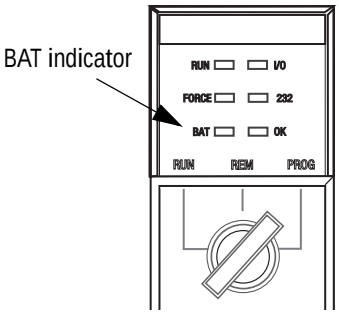
ATTENTION

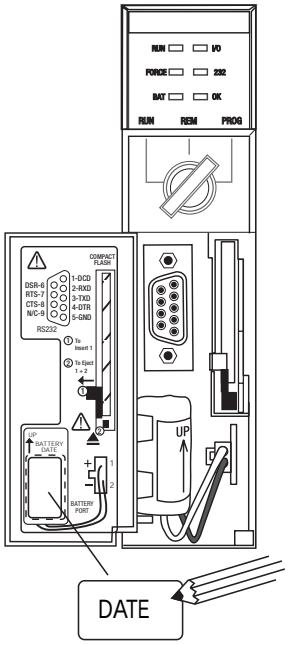
Install only a 1756-BA2 battery. Other batteries could damage the controller.

Step	Details
1. Remove the old battery.	A. Is the old battery leaking or damaged? • If YES, continue with step B. • If NO, go to step C. B. Look in Guidelines for Handling Lithium Batteries, publication AG-5.4, and read the information on how to handle damaged or leaking batteries. C. Follow these steps to decide if the controller needs power while you change the battery.

If you need to keep the	Then
Current setting of the controller's clock	Turn on the chassis power.
Information about nonrecoverable faults	Turn on the chassis power.
Neither of the above	Leave the chassis power on or off.

D. Remove the old battery.

Step	Details
2. Install a new 1756-BA2 battery.	 A. Insert the battery with the arrow pointing up as shown. B. Connect the battery. + red - black
3. Make sure the new battery is OK. 	A. Turn on the chassis power if it's not already on. B. What color is the BAT indicator? • If it is OFF, then the battery is OK. Go to step 4. • If it is RED, then continue with step C. C. Make sure you correctly connected the battery. D. What color is the BAT indicator now? • If it is OFF, then the battery is OK. Go to step 4. • If it is RED, then continue with step E. E. Try another 1756-BA2 battery. F. What color is the BAT indicator now? • If it is OFF, then this battery is OK but the earlier battery is also depleted. Go to step 4. • If it is RED, then contact your Rockwell Automation representative or local distributor.

Step	Details
4. Write down when you installed the new battery.	 A. Find the small rectangular label that comes with the new battery. B. Write today's date on the label. C. Attach the label to the inside of the controller door.
5. Safely dispose the depleted battery or batteries.	To dispose of depleted batteries, see Guidelines for Handling Lithium Batteries, publication AG-5.4. That publication comes with the new battery.

Storing Batteries

Follow these general rules to store your batteries.

ATTENTION

- Store batteries in a cool, dry environment. We recommend 25 °C (77 °F) with 40…60% relative humidity.
- You may store batteries for up to 30 days between -45…85 °C (-49…185 °F), such as during transportation.
- To avoid leakage or other hazards, **do not** store batteries above 60 °C (140 °F) for more than 30 days.

For detailed guidelines on how to store your batteries, see Guidelines for Handling Lithium Batteries, publication AG-5.4. The publication comes with your new battery.

Notes:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://support.rockwellautomation.com, you can find technical manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect Support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://support.rockwellautomation.com.

Installation Assistance

If you experience a problem with a hardware module within the first 24 hours of installation, please review the information that's contained in this manual. You can also contact a special Customer Support number for initial help in getting your module up and running.

United States	1.440.646.3223 Monday – Friday, 8am – 5pm EST
Outside United States	Please contact your local Rockwell Automation representative for any technical support issues.

New Product Satisfaction Return

Rockwell tests all of its products to ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning, it may need to be returned.

United States	Contact your distributor. You must provide a Customer Support case number (see phone number above to obtain one) to your distributor in order to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for return procedure.

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Publication 1756-AP014B-EN-E - January 2007 PN 953030-84
Supersedes Publication 1756-AP014A-EN-E - November 2004
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